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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,861	07/10/2001	Anhui Liang		5992

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EXAMINER
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PHAN, HANH

ART UNIT	PAPER NUMBER
2633	3

DATE MAILED: 04/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/900,861

Applicant(s)

LIANG ET AL.

Examiner

Hanh Phan

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

**-In the abstract section, the form and legal phraseology often used in patent claims, such as "means" should be avoided. For example, in the abstract, line 1, the phrase "a new optical signal detection scheme by means of converting" should be avoided. Correction is required.**

**-In the abstract, line 7, the term "optional" should be avoided. Correction is required.**

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 7, the phrase "**or NRZ like**" renders the claims indefinite because the claims include elements not actually disclosed (those encompassed by "**or NRZ like**"), thereby rendering the scope of the claims unascertainable. See MPEP § 2173.05(d).

Claim 1 recites the limitation "**the optical RZ format**", "**the NRZ format**" and "**the receiver**" in lines 3 and 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 2 recites the limitation "**said the RZ format**", "**the transmitter**" and "**the pre-dispersion compensation unit**" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "**said the RZ format**" and "**the transmitter**" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "**said the optical fiber transmission system**" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "**said optical RZ pulse**" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "**the tolerance of both the amplitude fluctuation and the generalized timing jitter which includes the Gordon-Haus timing jitter, and the pulse position variation induced by the pulse interaction, interchannel**

**cross talks** " in lines 1-5. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 6, the phrase "**(including four-wave-mixing and cross-phase modulation)**" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding claims 7, 17 and 18, the words "**(optional)**" renders the claim indefinite because it is unclear whether the limitation(s) following the words are part of the claimed invention. See MPEP § 2173.05(d).

Claim 11 recites the limitation "**said the RZ pulse**" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites the limitation "**said the optical RZ pulses**" and "**said the optical pulse transformers**" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 17 recites the limitation "**said the receiver**" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation "**said the optical pulse transformers**" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5 and 7-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chraplyvy et al (Pub. No. US 2003/0007216 A1) in view of Prucnal et al (US Patent No. 6,448,913).

Regarding claim 1, referring to Figure 1, Chraplyvy discloses a method to improve the system performance of an optical fiber transmission system by using the optical RZ format as the transmission format (page 1, paragraphs [0005]-[0006] and page 2, paragraphs [0021]-[0025]).

Chraplyvy fails to teach transferring the RZ format to the NRZ format in front of the receiver then detecting the NRZ format at the receiver. However, Prucnal in US Patent No. 6,448,913 teaches transferring the RZ format to the NRZ format in front of the receiver then detecting the NRZ format at the receiver (col. 1, lines 9-67, col. 2, lines 1-8, lines 29-31, lines 45-63, col. 4, lines 16-67 and col. 5, lines 1-12). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the transferring the RZ format to the NRZ format in front of the receiver then detecting the NRZ format at the receiver as taught by Prucnal in the system of Chraplyvy. One of ordinary skill in the art would have been motivated to do this since Prucnal suggests in column 1, lines 9-67, col. 2, lines 1-8, lines 29-31, lines 45-63, col. 4, lines 16-67 and col. 5, lines 1-12 using such transferring the RZ format to the NRZ format in front of the receiver then detecting the NRZ format at the receiver have advantage of allowing providing the optical NRZ pulses having a high tolerance to timing jitter and amplitude jitter and to improve system performance.

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Regarding claims 2 and 10, Chraplyvy further teaches the RZ format is generated in the transmitter (i.e., optical transmitter 100, Fig. 1) and enter into the pre-dispersion compensation unit (Fig. 8, page 3, paragraph [0032]).

Regarding claims 3 and 11, Chraplyvy further teaches the RZ format is generated in the transmitter (i.e., optical transmitter 100, Fig. 1) and then enter into transmission link directly (i.e., transmission line 130, Fig. 3).

Regarding claims 4 and 12, the combination of Chraplyvy and Prucnal teaches the optical fiber transmission system can be the noise limited system or/and the generalized timing jitter limited systems (Fig. 1 of Chraplyvy and Figs. 1 and 2 of Prucnal).

Regarding claims 5 and 8, Chraplyvy further teaches the optical RZ pulse can be but not limited to be the format of dispersion managed soliton, conventional soliton, chirped RZ, non-chirped RZ, carrier-suppressed RZ, and carrier-suppressed chirped RZ etc. (page 1, paragraph [0005]).

Regarding claim 7, referring to Figure 1, Chraplyvy discloses an optical fiber transmission system comprising at least one optical transmitter (i.e., optical transmitter 100, Fig. 1) to generate optical RZ pulses, WDM multiplexers or couplers (i.e., WDM multiplexer 120, Fig. 1), pre-dispersion compensation units (Fig. 8, page. 3, paragraph [0032]), one transmission link (i.e., a transmission link 130, Fig. 1) consisted of fiber spans and amplifiers, post-dispersion compensation units (Fig. 8), WDM demultiplexer or couplers (i.e., WDM demultiplexer 140, Fig. 1) and receivers (i.e., receivers 150, Fig.

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1) to detect optical pulses (page 1, paragraphs [0005]-[0006] and page 2, paragraphs [0021]-[0025]).

Chraplyvy fails to teach transferring the RZ format to the NRZ format in front of the receiver then detecting the NRZ format at the receiver. However, Prucnal in US Patent No. 6,448,913 teaches transferring the RZ format to the NRZ format in front of the receiver then detecting the NRZ format at the receiver (col. 1, lines 9-67, col. 2, lines 1-8, lines 29-31, lines 45-63, col. 4, lines 16-67 and col. 5, lines 1-12). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the transferring the RZ format to the NRZ format in front of the receiver then detecting the NRZ format at the receiver as taught by Prucnal in the system of Chraplyvy. One of ordinary skill in the art would have been motivated to do this since Prucnal suggests in column 1, lines 9-67, col. 2, lines 1-8, lines 29-31, lines 45-63, col. 4, lines 16-67 and col. 5, lines 1-12 using such transferring the RZ format to the NRZ format in front of the receiver then detecting the NRZ format at the receiver have advantage of allowing providing the optical NRZ pulses having a high tolerance to timing jitter and amplitude jitter and to improve system performance.

Regarding claim 9, Chraplyvy further teaches the optical RZ pulses of each wavelength channel can have either two orthogonal polarization sub-channels or two co-polarization sub-channels at same wavelength (page 2, paragraph [0025]).

Regarding claim 13, Chraplyvy further teaches the optical fiber transmission can be point to point systems, ring networks or mesh networks (Fig. 1).



Regarding claim 14, Chraplyvy further teaches the optical fiber transmission system can be WDM system or single-wavelength system (Fig. 1).

Regarding claim 15, the combination of Chraplyvy and Prucnal teaches the optical pulse transformers can transform either the optical RZ pulses of single wavelength channel or multiple wavelength channels to NRZ pulses (Figs. 1 and 2 of Prucnal).

Regarding claim 16, the combination of Chraplyvy and Prucnal teaches the optical RZ pulses in front of the optical pulse transformers can be either with or without frequency chirp (Fig. 1 of Chraplyvy and Figs. 1 and 2 of Prucnal).

6. Claims 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chraplyvy et al (Pub. No. US 2003/0007216 A1) in view of Prucnal et al (US Patent No. 6,448,913) and further in view of Golovchenko et al (US Patent No. 6,243,181).

Regarding claim 6, Chraplyvy as modified by Prucnal discloses all the aspects of the claimed invention except fails to teach increasing the tolerance of both the amplitude fluctuation and the generalized timing jitter which includes the Gordon-Haus timing jitter, and the pulse position variation induced by the pulse interaction, interchannel cross talks and polarization-mode-dispersion (PMD) etc. However, Golovchenko in US Patent No. 6,243,181 teaches increasing the tolerance of both the amplitude fluctuation and the generalized timing jitter which includes the Gordon-Haus timing jitter, and the pulse position variation induced by the pulse interaction, interchannel cross talks and polarization-mode-dispersion (PMD) etc. (col. 4, lines 3-67

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and col. 5, lines 1-58). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the increasing tolerance of both the amplitude fluctuation and the generalized timing jitter which includes the Gordon-Haus timing jitter, and the pulse position variation induced by the pulse interaction, interchannel cross talks and polarization-mode-dispersion (PMD) etc. as taught by Golovchenko in the system of Chraplyvy modified by Prucnal. One of ordinary skill in the art would have been motivated to do this since Golovchenko suggests in column 4, lines 3-67 and col. 5, lines 1-58 using such increasing the tolerance of both the amplitude fluctuation and the generalized timing jitter which includes the Gordon-Haus timing jitter, and the pulse position variation induced by the pulse interaction, interchannel cross talks and polarization-mode-dispersion (PMD) etc. have advantage of allowing providing the optical signals having a high tolerance to timing jitter and amplitude jitter and reducing the collision induced timing jitter and to improve system performance.

Regarding claim 18, the combination of Chraplyvy, Prucnal and Golovchenko teaches an optical pre-amplifier to amplify the RZ pulses, an optical filter to filter ASE noise and a span of normal dispersion fiber to transform high power optical RZ pulses to optical NRZ pulses by the combination effects of self-phase modulation and normal dispersion (Fig. 2 of Golovchenko, col. 4, lines 3-67 and col. 5, lines 1-58).

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chraplyvy et al (Pub. No. US 2003/0007216 A1) in view of Prucnal et al (US Patent No. 6,448,913) and further in view of Webb (US Patent No. 6,163,394).

Regarding claim 17, Chraplyvy as modified by Prucnal discloses all the aspects of the claimed invention except fails to teach the receiver includes low pass electrical filter and a decision circuit. However, Webb in US Patent No. 6,163,394 teaches an optical receiver includes low pass electrical filter and a decision circuit (Figs. 1, 2 and 4, col. 2, lines 35-44). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the receiver includes low pass electrical filter and a decision circuit as taught by Webb in the system of Chraplyvy modified by Prucnal. One of ordinary skill in the art would have been motivated to do this since Webb suggests in column 2, lines 35-44 using such a receiver includes low pass electrical filter and a decision circuit has advantage of allowing selecting the wanted signal and eliminating the unwanted signals and signal noise to improve the signal to noise ration, reducing the bit error rate, and to improve the system performance.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gehlot (US Patent No. 6,377,377) discloses apparatus for reducing phase modulated gain fluctuations in optical communication systems.

Desurvire et al (US Patent No. 6,201,621) discloses optical regeneration for optical fiber transmission system for non-soliton signals.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (703)306-5840.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (703)305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.



Hanh Phan

04/22/2004